

Amendments to the Claims

Claims 1-25. (Cancelled)

Claim 26. (Withdrawn-Currently Amended) A method of inducing the production of granulocytes in a subject in need, comprising administering a ~~therapeutically-effective~~ therapeutically-effective amount of an acetylcholinesterase (AChE)-derived AChE-derived peptide, or functional fragments, derivatives or a composition thereof to said subject, wherein said peptide is denoted by ~~SEQ-ID: NO:1~~ SEQ ID NO:1.

Claim 27. (Withdrawn-Currently Amended) A method for inducing repopulation and/or rematuration of granulocytic cell population in a subject in need, comprising administering a ~~therapeutically-effective~~ therapeutically-effective amount of an AChE-derived peptide, or functional fragments, derivatives or a composition thereof to said subject, wherein said peptide is denoted by ~~SEQ-ID: NO:1~~ SEQ ID NO:1.

Claim 28. (Withdrawn-Currently Amended) A method of enriching a specific hematopoietic cell population *in vitro* or *in vivo*, comprising contacting a hematopoietic cell population with an effective amount of an AChE-derived peptide, or functional fragments, derivatives, or a composition thereof, wherein said specific hematopoietic cell population is a granulocytic cell population, and said peptide is denoted by ~~SEQ-ID: NO:1~~ SEQ ID NO:1.

Claim 29. (Withdrawn) The method as defined in claim 28, wherein said enrichment of the granulocytic cell population is evidenced by an increase in the level of mature granulocytes as compared to the level of one of committed progenitor cells, committed myeloid cells, immature myeloid cells and immature granulocytes, following contact with said peptide, or fragments, derivatives, or a composition comprising thereof.

Claim 30. (Withdrawn-Currently Amended) A method of *ex vivo* or *in vitro* manipulating cells to induce granulocyte cell differentiation, said method comprising contacting a hematopoietic cell population with an effective amount of an AChE-derived peptide, or functional fragments, derivatives, or a composition thereof, wherein said peptide is denoted by ~~SEQ-ID-NO:1~~ SEQ ID NO:1.

Claim 31. (Withdrawn-Currently Amended) A method for the treatment of leucopenia in a subject in need, said method comprising administering a ~~therapeutically-effective~~ therapeutically-effective amount of an AChE-derived peptide, or functional fragments, derivatives or a composition thereof to said subject, wherein said peptide is denoted by ~~SEQ-ID-NO:1~~ SEQ ID NO:1.

Claim 32. (Withdrawn-Currently Amended) A method of treatment of conditions that trigger low cell count of granulocytes, comprising the steps of administering a ~~therapeutically-effective~~ therapeutically-effective amount of an AChE-derived peptide, or functional fragments or derivatives, or a composition thereof to a subject in need, wherein said AChE-derived peptide is denoted by ~~SEQ-ID-NO:1~~ SEQ ID NO:1.

Claim 33. (Withdrawn-Currently Amended) A method of treatment of conditions that trigger low cell count of leukocytes, comprising the steps of administering a ~~therapeutically-effective~~ therapeutically-effective amount of an AChE-derived peptide, or functional fragments, derivatives or a composition thereof to a subject in need, wherein said AChE-derived peptide is denoted by ~~SEQ-ID-NO:1~~ SEQ ID NO:1.

Claim 34. (Cancelled)

Claim 35. (Currently Amended) A method for inducing a shift in the activity of lymphocytes *in vitro* or *ex vivo*, comprising contacting an ~~acetylcholinesterase (AChE)-derived~~ AChE-derived

peptide with lymphocytes for a suitable period of time, wherein the AChE-derived peptide comprises the amino acid sequence set forth in SEQ ID NO:1.

Claim 36. (Cancelled)

Claim 37. (Currently Amended) A method of treatment of conditions wherein lymphocyte activity is reduced ~~, such as chronic stress, autoimmune diseases, inflammation, rheumatoid arthritis, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), fibromyalgia, multiple chemical sensitivity, post irradiation, chemotherapy in a subject in need, comprising obtaining blood from said subject, isolating immature cells and contacting said cells with an AChE-derived peptide, or functional fragments, derivatives, or a composition thereof, wherein said peptide is denoted by SEQ. ID. NO. 1~~

in a subject in need thereof, said method comprising:

- (a) obtaining blood from a subject;
- (b) isolating immature cells from the blood;
- (c) contacting the immature cells with an acetylcholinesterase (AChE)-derived peptide; and
- (d) introducing the immature cells into the subject, wherein said peptide is denoted by SEQ ID NO:1 and wherein the condition is selected from the group consisting of chronic stress, autoimmune diseases, inflammation, rheumatoid arthritis, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), fibromyalgia, multiple chemical sensitivity, post-irradiation, and chemotherapy.

Claim 38. (Withdrawn-Currently Amended) A method of priming [[of]] hematopoietic stem cells pre-transplant, comprising obtaining said cells, isolating from said cells [[a]] an immature, CD34+ rich population, and exposing said cell population to an AChE-derived peptide, or its functional fragments or derivatives, or compositions comprising thereof, wherein said peptide is denoted by ~~SEQ-ID-NO. 1~~ SEQ ID NO:1.

Claim 39. (Withdrawn) The method as defined in claim 38, wherein said cells may be obtained from the subject in need of said transplant or from another donor.

Claim 40. (Withdrawn-Currently Amended) A method of inducing blood cells to produce cytokines, comprising obtaining said cells from a subject in need of cytokine-producing blood cells, isolating immature cells and contacting said cells with an AChE-derived peptide, or functional fragments, derivatives or a composition thereof, wherein said peptide is denoted by ~~SEQ ID NO. 1~~ SEQ ID NO:1.

Claim 41. (Withdrawn-Currently Amended) The method as defined in claim 40, wherein said cytokines are selected from the group consisting of TNF α , IL-6, [[and]] IL-1 β , and thrombopoietin.

Claim 42. (New) The method of claim 37, wherein the immature cells obtained from the subject in step (a) are introduced in step (d) to the same subject.

Claim 43. (New) The method of claim 37, wherein the immature cells obtained from the subject in step (a) are introduced in step (d) to a different subject.